

WHAT IS CLAIMED IS:

1. A module for containing a circuit for performing discrete circuit functions on a radio frequency signal, said module comprising:

a housing of electrically conductive material defining an enclosed interior;

said housing having a front face and an opposite rear face separated by opposite sidewalls and opposite end walls;

a plurality of coax connectors secured to said rear face with an outer shield of said connectors electrically coupled to said housing;

a circuit board contained within said interior and positioned generally parallel to and spaced between said sidewalls;

said circuit board having a component side opposing a first of said sidewalls and a ground side opposing a second of said sidewalls;

said ground side including a layer of electrically conductive material electrically connected to said housing;

a plurality of coax cable connection locations on said ground side of said circuit board, each of said coax cable connections including a ground connection for connecting ground shields of coax cables to said layer of electrically conductive material;

said component side of said circuit board including a plurality of circuit components interconnected

with one another and with said coax cable connection locations through a plurality of circuit paths;

a plurality of coax cables disposed within said interior and connected to individual ones of said coax connectors and said coax cable connection locations, each of said coax cables having ground shields connected to said outer shields of said connectors and to said ground connections of said coax cable connection locations; and

said plurality of cables routed for said cables to be disposed between said ground side of said circuit board and said second of said sidewalls.

2. A module according to claim 1 wherein said circuit paths are sized to have an impedance selected to balance a parasitic reactance between said circuit board and said housing.

3. A module according to claim 1 wherein said plurality of components includes splitter components for receiving a main signal from one of said coax connection locations and dividing said main signal into a plurality of branch signals delivered along said circuit paths to individual remaining ones of said coax connection locations.

4. A module according to claim 1 wherein said splitters components are adapted to act as combiner components for receiving said plurality of branch signals from said individual ones of said coax connection locations and combining said branch signals into said main signal

delivered along one of said circuit paths to said one of said coax connection locations.

5. A module according to claim 3 wherein said splitter components includes at least a first splitter and a second splitter connected in series.

6. A module according to claim 5 wherein said splitter components includes a third splitter connected in series with said first splitter and in parallel with said second splitter.

7. A module according to claim 3 wherein said circuit components include a plurality of attenuators associated with individual ones of said branch circuits.

8. A module according to claim 7 wherein said attenuators include a variable attenuator component for varying an amount of attenuation of said attenuators.

9. A module according to claim 8 wherein said attenuators includes a first attenuator component mounted on said component side of said circuit board and said variable attenuator component removably secured to said first component with said variable attenuator component selected for a fixed desired attenuation.

10. A module according to claim 9 wherein:

said attenuators are positioned adjacent said front face;

said front face having an opening sized to pass said second variable attenuator component through said front face;

an electrically conductive cover releasably secured to said front face and sized to cover said opening.

11. A module according to claim 10 wherein said cover and said front face include an electrically conductive, mechanically deformable seal.

12. A module according to claim 1 wherein said front face is removable from a remainder of said housing and includes electrically conductive, mechanically resilient conductors extending between said front face and said layer of conductive material.

13. A module according to claim 12 wherein said front face includes a protruding ledge disposed to support a leading edge of said circuit card.

14. A module according to claim 3 wherein said circuit components include a directional coupler for diverting a portion of said main signal to a connector location connected to a monitor coax connector.

15. A module according to claim 14 wherein said monitor coax connector is exposed on said front face.

16. A module according to claim 1 wherein said circuit components include a directional coupler.

17. A module according to claim 16 wherein said components include an equalizer for equalizing a radio frequency signal along a frequency range.

18. A module according to claim 17 wherein said equalizer includes a first equalizer component mounted on said component side of said circuit board and a variable equalizer component removably secured to said first component with said variable equalizer component selected for a fixed desired radio frequency equalization.

19. A module according to claim 18 wherein:

said equalizer is positioned adjacent said front face;

said front face having an opening sized to pass said second variable equalizer component through said front face;

an electrically conductive cover releasably secured to said front face and sized to cover said opening.

20. A chassis and module combination for permitting selective housing of a plurality of modules containing radio frequency circuits, said combination comprising:

A. a plurality of modules each having:

a housing of electrically conductive material defining an enclosed interior;

said housing having a front face and an opposite rear face separated by opposite sidewalls and opposite end walls, with each of said faces and sidewalls being of predetermined dimension and

with said sidewalls being parallel to one another;

a plurality of coax connectors secured to said rear face with an outer shield of said connectors electrically coupled to said housing;

a circuit board contained within said interior and positioned generally parallel to and spaced between said sidewalls;

said circuit board having a component side opposing a first of said sidewalls and a ground side opposing a second of said sidewalls;

said ground side including a layer of electrically conductive material electrically connected to said housing;

a plurality of coax cable connection locations on said circuit board, each of said coax cable connections including a ground connection for connecting ground shields of coax cables to said layer of electrically conductive material;

said component side of said circuit board including a plurality of circuit components interconnected with one another and with said coax cable connection locations through a plurality of circuit paths;

said circuit components selected to perform a circuit function on a radio frequency signal supplied to one of said connectors and to provide an output radio frequency signal to a remainder of said connectors;

a plurality of coax cables disposed within said interior and connected to individual ones of said coax connectors and said coax cable connection locations, each of said coax cables having ground shields connected to said outer shields of said connectors and to said ground connections of said coax cable connection locations;  
each of said end walls having a projecting flange extending in a common plane generally parallel to said sidewalls and with said common plane offset from a central longitudinal axis of said housing;  
said front face including end portions extending beyond each of said end walls;  
a locking member secured to each of said end portions and having a locking end extending through a rear surface of said end portions;  
at least one of said locking members positioned offset from a longitudinal axis of said front face;

B. a first chassis having:

a first chassis frame including horizontally spaced apart first sidewalls and vertically spaced apart first top and bottom walls with said first top and bottom walls spaced apart by a distance substantially equal to a distance between said end walls of said modules;  
each of said first top and bottom walls including a plurality of vertically aligned first grooves sized to slidably receive said projecting flanges;

said first grooves spaced along said first top and bottom walls for a predetermined number of said modules to be slidably received within said first frame in a vertical orientation with said longitudinal axis of said front face vertically disposed and with opposing sidewalls of adjacent modules narrowly spaced apart;

a plurality of first mating lock members on each of said first top and bottom walls and positioned to mate with said locking members of said modules when said modules are received within said first frame in a predetermined orientation and with said flanges received within said first grooves;

C. a second chassis having:

a second chassis frame including horizontally spaced apart second sidewalls and vertically spaced apart second top and bottom walls;

an intermediate wall extending vertically between said second top and bottom walls and centrally positioned between said second sidewalls with said intermediate wall dividing said second frame into a left column and a right column;

said second sidewalls spaced from said intermediate wall by a distance substantially equal to a distance between said end walls of said modules;

each of said second sidewalls and intermediate wall including a plurality of horizontally aligned second grooves sized to slidably receive said projecting flanges;



said second grooves spaced along said second sidewalls and said intermediate wall for half of said predetermined number of said modules to be slidably received within said left column of said second frame in a horizontal orientation with said longitudinal axis of said front face horizontally disposed and with opposing sidewalls of adjacent modules narrowly spaced apart; said second grooves further spaced along said second sidewalls and said intermediate wall for half of said predetermined number of said modules to be slidably received within said right column of said second frame in a horizontal orientation with said longitudinal axis of said front face horizontally disposed and with opposing sidewalls of adjacent modules narrowly spaced apart; and a plurality of second mating lock members on each of said second sidewalls and intermediate wall and positioned to mate with said locking members of said modules when said modules are received within said second frame in a predetermined orientation and with said flanges received within said second grooves.